

REMARKS

Claims 1 through 8 and 12 through 25 are in the application and are presented for consideration. By this amendment, applicant has addressed the formal issues in each of claims 5, 6, 12 and 7. Additionally, claims 9 through 11 have been canceled. Subject matter similar to original claim 9 has been added to each of the independent claims 1, 14 and 17. Further, new claims 21 through 25 have been added. Applicant has also paid the fee for 2 claims in excess of 20 and 2 extra independent claims.

Claims 5 through 8, 12 the 13 had been rejected under 35 U.S.C. section 112, second paragraph become as being indefinite. It is Applicant's position that the issues have been resolved by this response. Applicant wishes to thank the Examiner for the careful reading of the claims and for the helpful comments.

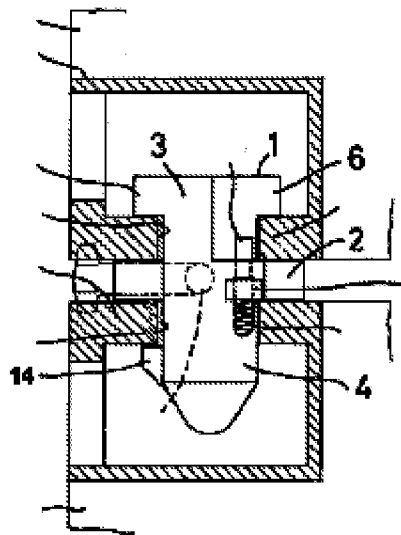
Claims 1 – 5, and 9 – 20 have been rejected under 35 U.S.C. section 102 (b) as being anticipated by TAKAGUCHI. The rejection is based on the position that TAKAGUCHI teaches each of the features as required by the claims. It is Applicant's position that the prior art as a whole fails to teach the combination of features claimed.

The invention presents a significant departure from the concepts of prior art coupling pieces. Most notably, the invention provides a fully automatic coupling piece (wherein it is not necessary to pull a lever or otherwise rotate a catch out of engagement). The invention does this by providing a non-positive connection (a friction connection) of the coupling piece with the corner fitting at the lower (second) coupling projection. A non-positive connection or friction connection differs from a positive connection, in which the metal of the coupling

piece directly blocks movement of the coupling piece relative to the corner fitting. With a positive connection the metal of the catch piece must physically break for there to be a disconnection, without the manual rotation of the catch piece by a lever. With a non-positive connection the friction between contacting members provides the locking. It has been found that the nonpositive connection of the invention provides secure holding of stacked containers while allowing an upper container of a stack to be lifted directly upwardly off the lower container (an automatic disengagement). The upper container can be lowered directly downwardly onto the lower container for an automatic engagement. This is a significant departure from the prior art structure. The resulting function has been sought after for many years as discussed below.

Containers have been used extensively in shipping with modern container systems being more or less, an invention of Second World War. The United States shipped a large quantity of military equipment to Europe. To increase the speed of loading and unloading containers were used on seagoing ships. At an early stage, such containers were lashed with manually operated twist locks. With these manually operated twist locks a person had to close and open the twist lock manually. This is very time-consuming.

As a first improvement, semi-automatic systems were developed. One such semiautomatic twist lock closes automatically when the container is loaded but has to be opened manually to unload the container. The coupling piece of TAKAGUCHI is an example for such a semi-automatic devise. The locking nose 14 is automatically pushed in the lower coupling projection 4 when the container is loaded. However, the locking nose 14 must be



rotated for the coupling piece to be opened. This is done manually via the handle 17 when the container is unloaded. As illustrated in the adjacent sketch, which is based on Fig. 10 of TAKAGUCHI, there is only a vertical force applied on the locking nose 14, as indicated by the added (red) arrow. This vertical force occurs when the locking nose 14 hits the outside margin of the hole 23 of the corner fitting 20. Since the locking nose 14 has a horizontal upper shoulder there is only a vertical

force and no horizontal component.

It can be noted that TAKAGUCHI fails to teach and fails to suggest the features of independent claims 1, 14 and 17 wherein the locking catch for locking inside the corner fitting is arranged extending laterally relative to the container and also has a sloping shoulder at its top side. Such a sloping surface provides a friction surface or non-positive connection. New claims 21 through 25 highlight similar structural features (in means plus function format). These features of all of these claims present a significant departure from the teachings of TAKAGUCHI. Accordingly, it is requested that the rejection under 35 U.S.C. section 102 (b) be reconsidered as TAKAGUCHI fails to teach each and every feature as specified in the claims.

Claims 6 through 8 have been rejected under 35 USC section 103(a) as being obvious based on the teachings of TAKAGUCHI in view of NITSCHKE et al. It is Applicant's position that the prior art as a whole fails to provide teachings or suggestions which would render

applicants claimed invention obvious. Accordingly, reconsideration of the rejection is requested, in view of the discussion below and in view of the revised and new claims.

NITSCHE et al. discloses a semi-automatic system which also relies on positive engagement locking. The containers shown in NITSCHE et al. are secured at the corner fitting of one side of the containers via a semi-automatic twistlock while on the other side a so called mid-lock 26 has been used. Again, the twist locks lock automatically when the container is loaded but must be opened manually via a handle 15 when the container is to be unloaded (column 6, lines 52 through 61).

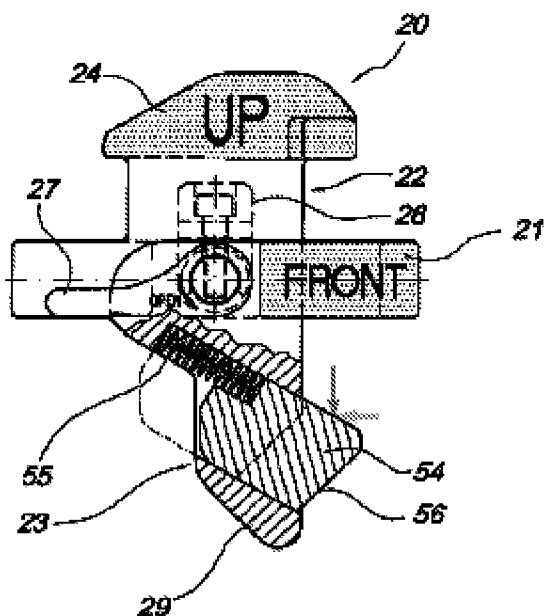
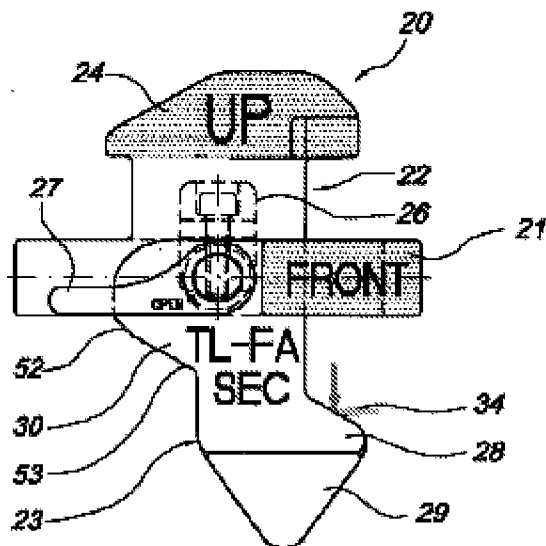
Mid-locks, such as the mid-lock 26, lock and unlock fully automatically. However, such mid-locks can be used only at one end of the container while on the other end semi-automatic twist locks have to be used. In other words: mid-locks only can function as a pair together cooperating with a pair of semi-automatic or fully manually twist-locks. As a result, the system shown by NITSCHE et al. still is a semiautomatic system. Mid-locks are used whenever two containers of 20 feet length are stored behind one another on a storage place for containers of 40 feet length. The reason is that the gap between the two 20-feet-containers is too small for the operator (stevedore) to get access to the lashing material for opening the same.

The above described semi-automatic systems have very much improved the lashing time for dealing with containers aboard ships. However, there was an ongoing need for fully automatic systems since such would significantly improve lashing time (and speed of loading and unloading). As a result, many attempts have been made in the past to provide fully

automatic connectors. This is evident from the discussion of the need for automatic systems in the patent literature. However, none of these connectors has ever entered into practical use.

It would initially appear that a fully automatic connector is disclosed in US 3,973,684. However, after the containers have been preliminary secured via the connectors 20 they still have to be secured finally by the lashing 16. Hence, the shown system still is not a fully automatic system in the sense of the invention.

The present invention provides the first fully automatic twist lock that has entered into practice with great economic success. Although the features of the invention include features which are present in some prior art arrangements, the structure and function according to the invention are quite different from the prior art. The direction of the locking catch (locking nose) is rotated by 90° compared with the prior art mid-locks. However, a function very different from the mid-lock function is provided based on providing a friction engagement surface (the sloping shoulder 34 at the locking catch 28) and other features as noted in the claims (see annotated Figures below). A vertical force applied to the locking catch 28, as shown by the added vertical (red) arrow, generates a resulting horizontal component, as shown by the added horizontal (green) arrow. This pushes the connector in a like horizontal (lateral) direction and disengages the coupling piece fully automatically when the container is lifted upwardly for unloading. Although the annotated figures are the embodiment of Figures 15 and 16, the same effect occurs with the embodiment of Figure 2, namely an upward lifting of the coupling piece (by lifting the upper container) results in the coupling piece being forced



laterally and out of engagement. It has been further surprisingly noted that the coupling piece provides a full locking during use based on the fact that a direct upward movement is not generated during shipping (the motion of the ship causes torsional movement in which case the locking state is fully maintained). The invention provides a solution to a long felt need which has been well documented in the prior art literature. Further, the invention provides a surprising result in that a nonpositive connection provides a fully secure locking for shipment while allowing fully automatic loading and unloading.

With knowledge of Applicant's invention (hindsight) the present invention looks very simple. The invention is similar to

the mid-lock 26 of NITSCHKE et al. but with the locking nose distorted by 90°. However, such a hindsight approach is improper and does not provide any meaningful insight as to nonobviousness and patentability. Instead, as further discussed below, the person of ordinary skill in the art is not provided with teachings from the semiautomatic twist lock prior art

(TAKAGUCHI) and the mid-lock prior art (NITSCHKE et al.) which would render the combination of features as claimed obvious.

Each of NITSCHKE et al. and TAKAGUCHI teach semi automatic systems. TAKAGUCHI discloses a semi automatic lock which locks automatically and is to be unlocked manually by using the handle 17. NITSCHKE et al. pertains to mid-locks 26 which are used together with a semi automatic twist lock 14 as it is apparent from column 6 lines 62 through 61 of NITSCHKE et al. Again, the semi automatic twist lock needs to be unlocked manually via the handle (the lever connection). Like systems are known in the art for more than 20 years prior to the invention and have become standard aboard ships.

Although there was an ongoing need for fully automatic twist locks, for many decades, no successful fully automatic twist lock is believed to have entered into commercial use (exceeded prototype status). US 3,973,684 published back in 1970 pointed out:

“Thus the need still exists for a vertical fastener which does not require special tools or human interaction for its release...” (column 1, line 34 to 36).

This proves that the need for fully automatic twist locks existed back in 1970, some 32 years prior to the invention. However, US 3,973,684 still proposes the semi automatic system since the preliminary secured containers need to be secured finally by a additional lashing 16 as well.

Further proposals of fully automatic twist locks have been disclosed in DE 43 07 781 A1 and WO 01/76980 A1 corresponding to JP 2003-530 280 T2. Both fully automatic twist locks never have exceeded prototype status. They never entered into a commercial use.

TAKAGUCHI was filed in 1983, about 19 years prior to the priority date of the

invention. The well-known long felt need for a solution and a long period of time in which no practical solution has been provided present additional considerations evidencing the nonobviousness and patentability of the present invention according to the combination as claimed.

As the prior art overwhelmingly directs the person ordinary skill in the art toward a positive locking (in which the metal parts engage such that a breaking of the metal parts is required for disengagement, apart from the manual disengagement by rotation or the like), the prior art teachings present a strong bias toward positive locking. The person of ordinary skill in the art is effectively directed away from a frictional lock in such a dynamic oceangoing locking situation. The prior art presents evidence that the person of ordinary skill in the art was directed toward positive locking as an essential feature for the secure lashing of containers aboard seagoing ships.

The invention has broken with the strong bias of the prior art and skipped positive locking as a first basic principle for the lower connection of the coupling pieces. As can be easily seen from the specification and the accompanying drawings there might be a situation where a container may be unlocked (namely disengagement occurs by an upward lifting of one container from the lower container). However, the inventor found out that under sea conditions, where a seagoing ship is rolling and pitching, this situation never occurs. Only where a ship is in a calm situation (harbor setting) can the container be unlocked. This has been proven on many ships equipped with fully automatic twist locks of the Applicant.

Applicant's invention has encountered significant economic success based on its

drastically different function and based on its meeting the long felt need noted above. If necessary, this can be documented as the great economic success is a secondary consideration to be considered with regard to nonobviousness. However, the evidence of record does document the long felt need with regard to automatic systems. The great economic success of fully automatic twist locks according to the invention is demonstrated by some 80% of the ships equipped by the Applicant being equipped with fully automatic twist locks. Some ship owning companies exchanged semi automatic systems with fully automatic twist locks although the semi automatic systems had not yet been worn out. Further, economic success is demonstrated by others copying or attempting to copy the features according to the invention. Shortly after the Applicant introduced the fully automatic twist lock onto the market, according to the claimed invention, the invention was copied by three German competitors. One of these has stopped such copying after receiving a warning letter by the Applicant. Two other German competitors have been enjoined by a German court (the District Court of Düsseldorf). These facts further show significant success of the particular design. The success is significant given that the closest prior art designs have been known for some time. The success is also significant given the long felt need for an automatic system as provided according to the present invention.

The Examiners requested to reconsider the rejections and favorably consider the claims as now presented. It is further requested that applicant have an opportunity to discuss the application with the examiner during a personal interview, if this is convenient. In particular, Applicant would appreciate the opportunity to show some video demonstrating the operation

of the invention, and also show information as to operation of prior art designs.

Further and favorable action on the merits is requested.

Respectfully submitted
for Applicant,



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